

**AMENDMENTS TO THE SPECIFICATION**

Please replace paragraph [0030] with the following rewritten paragraph:

-- [0030] With reference to Fig. 3 and with continuing reference to Figs. 1 and 2, to determine threshold voltage ( $V_T$ ), means for applying electrical stimulus 32 applies a voltage  $V_{DS}$  across the drain D and source S (contacts 18 and 20, respectively) and applies a voltage  $V_{GS}$  across gate G and the source S (chuck 14 and contact 20, respectively). For the purpose of measuring threshold voltage  $V_T$ ,  $V_{DS}$  and  $V_{GS}$  are derived from a common voltage source. Stated differently, for the purpose of measuring the threshold voltage  $V_T$ , one terminal of a DC voltage source is connected to the drain D and gate G (contact 18 and chuck 14, respectively) of transistor T and the other terminal is connected to ~~substrate~~ source S (contact 20). This DC voltage is then swept from a first voltage, e.g., 0 volts, toward a second voltage, e.g., 15 volts. During this sweep, measurement means 34 measures the swept DC voltage and the current ( $I_{DS}$ ) flowing between drain D and source S (contacts 18 and 20, respectively) in response to the swept DC voltage. An exemplary curve 38 of the drain-to-source current ( $I_{DS}$ ) versus the swept DC voltage, in this example referred to as the gate-to-source voltage ( $V_{GS}$ ), is shown in Fig. 3. --

Please replace paragraph [0033] with the following rewritten paragraph:

-- [0033] With reference to Fig. 5 and with continuing reference to Figs. 1-4, to determine the interface trap density ( $D_{IT}$ ) of semiconductor top layer 8, means for applying electrical stimulus 32 applies a reference voltage  $V_R$  to drain D and/or ~~gate G~~ source S (contacts 18 and 20, respectively), of transistor T and applies a gate voltage  $V_G$  to gate G (chuck 14) of transistor T. Subject to maintaining the voltage applied between gate G and drain D and/or source S, i.e.,  $V_{GD}$  and/or  $V_{GS}$ , below the threshold voltage  $V_T$  of SOI wafer 4,  $V_G$  is swept from a first value toward a second value and reference voltage  $V_R$  is changed to maintain transistor T below its threshold voltage  $V_T$ . During the sweep of  $V_G$ , measurement means 34 measures the total current flowing through the drain D and/or source S. Hereinafter, this total current is referred to as " $I_D$ ". Measurement means 34 then determines the base 10 logarithm ( $\log_{10}$ ) of  $I_D$  at various points along the sweep of  $V_G$  and forms curve 44 of  $\log_{10} I_D$  versus  $V_G$ . The trap density of the interface between semiconductor top layer 8 and buried oxide layer 6 is then simply the slope of curve 44. --

Please replace paragraph [0036] with the following rewritten paragraph:

-- [0036] Once drain conductance  $g_D$  and  $C_{OX}$  have been determined, the values determined therefor can be utilized in the following equation EQ2 to determine the carrier mobility ( $\mu$ ) of semiconductor top layer 8:

$$\text{EQ2:} \quad \mu \approx Lg_D/[ZC_{OX}(V_{GS} - V_T)]$$

where:  $L$  = length of channel 36;  
 $Z$  = the width of channel 36;  
 $V_{GS}$  = the gate G to source S voltage applied to determine  $C_{OX}$ ; and  
 $V_T$  = threshold voltage determined in the manner discussed above in connection with Fig. 3. --

Please replace paragraph [0037] with the following rewritten paragraph:

-- [0037] A dopant concentration, or dopant density, of semiconductor top layer 8 can be determined from a doping profile of semiconductor top layer 8 determined by plotting threshold voltage  $V_T$  versus  $(2\phi_F - V_{BS})^{1/2}$  and measuring a slope  $m = \Delta V_T / \Delta (2\phi_F - V_{BS})^{1/2}$  where  $\phi_F$  is equal to the Fermi level of semiconductor top layer 8 and  $V_{BS}$  is equal to the voltage between semiconductor top layer 8 and source S (contact 20). --

Please replace paragraph [0039] with the following rewritten paragraph:

-- [0039] The doping concentration ( $N_{TOP}$ ) of semiconductor top layer 8 can then be determined utilizing the following equation EQ3:

$$\text{EQ3:} \quad N_{TOP} = m^2 C_{OX}^2 / 2qk_s \epsilon_0$$

where:  $m$  = doping profile of semiconductor top layer 8 determined in the manner described above;

$C_{OX}$  is the capacitance of buried oxide layer 6 determined in the manner described above in connection with Fig. 6;

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$q$  = ~~equal~~s the charge of an electron;

$k_s$  is the conduction factor of silicon determined in the manner described above in connection with Fig. 4; and

$\epsilon_0$  is the permittivity of air. --